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Serial No.: 09/433,332

Filing Date: November 3, 1999

Attorney Docket No. 100.115US01

Title: DIGITAL RETURN PATH FOR HYBRID FIBER/COAX NETWORK

REMARKS

Applicant has reviewed the Office Action mailed on November 5, 2002 and the references cited therewith. Claims 1-29 are pending in this application.

35 U.S.C. §103(a) Rejections

The Examiner rejected claims 1-4, 6, 9, 18, 20, 22, and 23 under 35 U.S.C. §103(a) as being unpatentable over Dapper et al. (U.S. Patent No. 6,282,683) in view of Chan et al. (U.S. Patent No. 4,816,825) and further in view of Eng et al. (U.S. Patent No. 4,754,451). Applicant respectfully traverses the rejection.

Claim 1:

Claim 1 is directed to a hybrid fiber/coax network with a head end and at least one optical distribution node coupled to the head end over at least one fiber optic link. The network also includes at least one coaxial cable link that is coupled to the at least one optical distribution node. The at least one optical distribution node receives upstream, digital data from a plurality of modems. The at least one optical distribution node further has a digital return path that includes a laser transmitter coupled to the fiber optic link that transmits the upstream, digital data to the head end, a data concentrator coupled to provide the upstream, digital data to the laser, and, for the at least one coaxial cable link, a frequency translator that receives and translates the upstream, digital data from the plurality of modems to a different carrier frequency and retransmits the signal to the plurality of modems for collision detection and a data interface coupled between frequency translator and the data concentrator that determines whether a collision occurred with the upstream, digital data is so as to prevent corrupted data from being passed on to the head end.

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None of the references, alone or in combination, teach or suggest the network of claim 1. For example, none of the references, alone or in combination, teach or suggest a hybrid fiber/coax network that includes an upstream, digital data path as called for in claim 1. None of the references, alone or in combination, teach or suggest a data path that uses a shared frequency band for upstream communication over a coaxial cable from a plurality of modems to a optical distribution node with a data interface in the optical distribution node that determines whether data is corrupted due to collision prior to forwarding the data to a data concentrator for transmission to a head end for possible transmission outside the system.

Further, the combination of Dapper and Chan is not proper. Chan appears to be concerned with power levels in a closed cable network that transports digital data. *Chan*, Col. 3, line 65 to Col. 4, line 21. Although Chan does appear to use frequency turn-around to retransmit data to modems for collision detection, Chan does this in an environment different from a hybrid fiber/coax (HFC) network and thus would necessarily involve a different set of problems than an HFC network. For example, Chan is concerned with power levels for signals being transmitted from one modem on its *closed* network to another modem on its *closed* network. Chan is not concerned with getting digital data to a head end for transmission to a point outside the network. Further, the Examiner recognizes that Dapper is an *open* system for transmitting digital data upstream. *Office Action*, ¶4 ("the fiber optic link [] transmits the upstream, digital data to the head end."). Since claim 1 is directed to an *open* system, one of ordinary skill in the art would not be motivated to combine the teachings of Chan (a closed system) with Dapper (an open system) to create the open system of claim 1. Thus, the combination of Chan and Dapper is not proper. Further, Eng provides no additional motivation to fill this void. Eng is not concerned with detecting collisions. Rather, Eng appears to address checking addresses in packets prior to concentration.

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Further, none of the references teach or suggest digital transmission between an optical distribution node and a head end in a hybrid fiber/coax network as called for in claim 1.

Therefore, claim 1 is not obvious.

Claims 2-4, 6, 9

Claims 2-4, 6, and 9 depend directly or indirectly from claim 1. Claims 2-4, 6, and 9 thus are likewise patentable.

Claim 18

Claim 18 is directed to an optical distribution node that provides an integral portion of an all digital return path for an HFC network. As with claim 1, the optical distribution node provides a digital data path that receives digital data on a shared frequency band for upstream communication from a coaxial cable from a plurality of modems. The optical distribution nodes has a data interface that determines whether data is corrupted due to collision prior to forwarding the data to a data concentrator for transmission to a head end for possible further. Thus, claim 18 contains similar elements to claim 1 that distinguish over the art. Further, as discussed above, the combination of references is improper. Therefore, for the reasons provided above with respect to claim 1, claim 18 is also not obvious over the art.

Claims 20, 22, and 23

Claims 20, 22, and 23 include the limitations of claim 18 and thus are also allowable.

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The Examiner rejected claim 5 under 35 U.S.C. §103(a) as being unpatentable over Dapper et al. ('683) in view of Chan et al. ('825) and further in view of Eng et al. ('451) as applied to claim 1, further in view of Kavchrad (U.S. Patent No. 4,701,909), and further in view of Greising (U.S. Patent No. 4,959,829). Applicant respectfully traverses this rejection.

Claim 5 depends from claim 1. Applicant thus incorporates the arguments applied to claim 1 above to traverse this rejection of claim 5. Applicant asserts that none of the references alone or in combination teach or suggest the network of claim 5 for the reasons provided above with respect to claim 1. Further, Applicant traverses the combination of references provided by the Examiner. As discussed above, there is no motivation to combine Dapper, Chan and Eng. Further, there is no teaching or suggestion in the references that justifies the modification of Dapper, Chan and Eng with two other references to incorporate the claimed collision detection signal. Therefore the rejection is improper.

The Examiner rejected claim 7 under 35 U.S.C. §103(a) as being unpatentable over Dapper et al. ('683) in view of Chan et al. ('825), further in view of Eng et al. ('451), as applied to claim 1, and further in view of Peyrovian (U.S. Patent No. 5,768,682). Applicant respectfully traverses this rejection.

Claim 7 depends indirectly from claim 1. Applicant thus incorporates the arguments applied to claim 1 above to traverse this rejection of claim 7. Applicant asserts that none of the references alone or in combination teach or suggest the network of claim 7 for the reasons provided above with respect to claim 1. Further, Applicant traverses the combination of references provided by the Examiner. There is no teaching

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or suggestion in the references that justifies the modification of Dapper with these three other references to achieve the claimed invention. Therefore the rejection is improper.

The Examiner rejected claims 8 and 21 under 35 U.S.C. §103(a) as being unpatentable over Dapper et al. ('683) in view of Chan et al. ('825), further in view of Eng et al. ('451) as applied to claims 1 and 18, and further in view of Beveridge (U.S. Patent No. 5,469,495). Respectfully, Applicant disagrees.

Claim 8 depends from claim 1. Applicant thus incorporates the arguments applied to claim 1 above to traverse this rejection of claim 8. Applicant asserts that none of the references alone or in combination teach or suggest the network of claim 8 for the reasons provided above with respect to claim 1. Further, Applicant traverses the combination of references provided by the Examiner. There is no teaching or suggestion in the references that justifies the modification of Dapper with these three other references to achieve the claimed invention. Therefore the rejection is improper.

Claim 21 depends from claim 18. Applicant thus incorporates the arguments applied to claim 18 above to traverse this rejection of claim 21. Applicant asserts that none of the references alone or in combination teach or suggest the network of claim 21 for the reasons provided above with respect to claim 18. Further, Applicant traverses the combination of references provided by the Examiner. There is no teaching or suggestion in the references that justifies the modification of Dapper with these three other references to achieve the claimed invention. Therefore the rejection is improper.

The Examiner rejected claim 19 under 35 U.S.C. §103(a) as being unpatentable over Dapper et al. ('683) in view of Chan et al. ('825) and further in view of Eng et al. ('451) as applied to claim 18, and further in view of Hutchison et al. (U.S. Patent No. 5,838,989). Respectfully, Applicant disagrees.

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Claim 19 depends from claim 18. Applicant thus incorporates the arguments applied to claim 18 above to traverse this rejection of claim 19. Applicant asserts that none of the references alone or in combination teach or suggest the network of claim 19 for the reasons provided above with respect to claim 18. Further, Applicant traverses the combination of references provided by the Examiner. There is no teaching or suggestion in the references that justifies the modification of Dapper with these three other references to achieve the claimed invention. Therefore the rejection is improper.

The Examiner rejected claims 10-12, 14, and 17 under 35 U.S.C. §103(a) as being unpatentable over Dapper et al. ('683) in view of Chan et al. ('825). Respectfully, Applicant disagrees.

Claim 10

Claim 10 calls for a hybrid fiber-coax network that includes a head end, at least one optical distribution node coupled to the head end over at least one fiber optic link to provide upstream, digital data to the head end and at least one coaxial cable link, coupled to the at least one optical distribution node, that receives the upstream, digital data from a plurality of modems. At least a portion of the upstream, digital data is transmitted over the at least one coaxial cable link on at least one modulated carrier below a frequency range for downstream transmission and the at least one optical distribution node includes circuitry for retransmitting upstream, digital data back over the at least one coaxial cable link to detect collisions on the at least one coaxial cable link.

As discussed above with respect to claim 1, There is no teaching, suggestion or motivation to combine Dapper and Chan. Thus, the combination is improper and the rejection cannot stand. Further, the combination of Dapper with Chan would not

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provide for transmission of digital data received from the coaxial cable links over the fiber to the head end as Chan teaches a closed system and thus would not extend to an open system. Therefore, claim 10 is also not obvious.

Claims 11, 12, 14, and 17

Claims 11, 12, 14, and 17 depend directly or indirectly from claim 10. As such, claims 11, 12, 14 and 17 are also allowable.

The Examiner rejected claim 13 under 35 U.S.C. §103(a) as being unpatentable over Dapper et al. ('683) in view of Chan et al. ('825) as applied to claim 10, and further in view of Kavehrad ('909), and further in view of Griesing ('829). Respectfully, Applicant disagrees.

Claim 13 depends from claims 10. Applicant thus incorporates the arguments applied to claim 10 above to traverse this rejection of claim 13. Applicant asserts that none of the references alone or in combination teach or suggest the network of claim 10 for the reasons provided above. Further, Applicant traverses the combination of references provided by the Examiner. There is no teaching or suggestion in the references that justifies the modification of Dapper with these three other references to achieve the claimed invention. Therefore the rejection is improper.

The Examiner rejected claim 15 under 35 U.S.C. §103(a) as being unpatentable over Dapper et al. ('683) in view of Chan et al. ('825) as applied to claim 10, and further in view of Peyrovian ('682). Respectfully, Applicant disagrees.

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Claim 15 depends from claim 10. Applicant thus incorporates the arguments applied to claim 10 above to traverse this rejection of claims 15. Applicant asserts that none of the references alone or in combination teach or suggest the network of claim 10 for the reasons provided above. Further, Applicant traverses the combination of references provided by the Examiner. There is no teaching or suggestion in the references that justifies the modification of Dapper with two other references to achieve the claimed invention. Therefore the rejection is improper.

The Examiner rejected claim 16 under 35 U.S.C. §103(a) as being unpatentable over Dapper et al. ('683) in view of Chan et al. ('825) as applied to claim 10, and further in view of Beveridge ('495). Respectfully, Applicant disagrees.

Claim 16 depends from claim 10. Applicant thus incorporates the arguments applied to claim 10 above to traverse this rejection of claim 16. Applicant asserts that none of the references alone or in combination teach or suggest the network of claim 10 for the reasons provided above. Further, Applicant traverses the combination of references provided by the Examiner. There is no teaching or suggestion in the references that justifies the modification of Dapper with these two other references to achieve the claimed invention. Therefore the rejection is improper.

The Examiner rejected claims 24, 25, and 29 under 35 U.S.C. §103(a) as being unpatentable over Dapper et al. ('683) in view of Chan et al. ('825), and further in view of Usi (U.S. Patent No. 4,531,239). Respectfully, Applicant disagrees.

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Claim 24

Claim 24 is directed to a method for processing data in a return path of a hybrid fiber/coax network. The method includes receiving, on a first coaxial cable, upstream, digital data modulated on a first carrier, translating the frequency of the first carrier to a second frequency, and retransmitting the upstream, digital data modulated on the carrier with the second frequency. The method checks for collisions detection signals based on the retransmitted upstream, digital data. The method further concentrates the upstream, digital data with upstream, digital data from other coaxial cables and transmits the concentrated, upstream, digital data to the head end.

None of the references, alone or in combination, teach or suggest the method of processing data in a return path of a hybrid fiber/coax network as called for in claim 24. None of the references, alone or in combination teach or suggest detecting collisions based on retransmitted upstream, digital data and transmitting the concentrated digital upstream data to the head end. Further, neither of the references, teach nor suggest digital transmission between the optical distribution node and a head end of a hybrid fiber/coax network.

Applicant further traverses the appropriateness of the combination of Dapper with Chan for the reasons identified above. Therefore, claim 24 is not obvious.

Claims 25 and 29

Claims 25 and 29 depend from claim 24 and thus are likewise allowable.

The Examiner rejected claim 26 under 35 U.S.C. §103(a) as being unpatentable over Dapper et al. ('683) in view of Chan et al. ('825), further in view of Usi ('239) as applied to claim 24, and further in view of Peyrovian ('682).

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Claim 26 depends from claim 24. Applicant thus incorporates the arguments applied to claim 24 above to traverse this rejection of claim 26. Applicant asserts that none of the references alone or in combination teach or suggest the method of claim 24 for the reasons provided above. Further, Applicant traverses the combination of references provided by the Examiner. There is no teaching or suggestion in the references that justifies the modification of Dapper with these two other references to achieve the claimed invention. Therefore the rejection is improper.

The Examiner rejected claim 27 under 35 U.S.C. §103(a) as being unpatentable over Dapper et al. ('683) in view of Chan et al. ('825), further in view of Usi ('239) as applied to claim 24, and further in view of Griesing ('829).

Claim 27 depends from claim 24. Applicant thus incorporates the arguments applied to claim 24 above to traverse this rejection of claim 27. Applicant asserts that none of the references alone or in combination teach or suggest the method of claim 24 for the reasons provided above. Further, Applicant traverses the combination of references provided by the Examiner. There is no teaching or suggestion in the references that justifies the modification of Dapper with these three other references to achieve the claimed invention. Therefore the rejection is improper.

The Examiner rejected claim 28 under 35 U.S.C. §103(a) as being unpatentable over Dapper et al. ('683) in view of Chan et al. ('825), further in view of Usi ('239) as applied to claim 24, and further in view of Beveridge ('495).

Claim 28 depends from claim 24. Applicant thus incorporates the arguments applied to claim 24 above to traverse this rejection of claim 28. Applicant asserts that none of the references alone or in combination teach or suggest the method of claim 24

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for the reasons provided above. Further, Applicant traverses the combination of references provided by the Examiner. There is no teaching or suggestion in the references that justifies the modification of Dapper with these two other references to achieve the claimed invention. Therefore the rejection is improper.

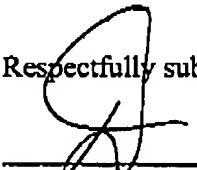
CONCLUSION

Claims 1-29 are currently pending. Applicant respectfully submits that the claims are in condition for allowance and notification to that effect is earnestly requested. If the Examiner has any questions or concerns regarding this application, please contact the undersigned at (612) 332-4720, ext. 225.

If necessary, please charge any additional fees or credit overpayment to Deposit Account No. 502432.

Date: March 5, 2003

Respectfully submitted,



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